Asia: Monthly Climate Outlook December to September

Issued: March 2023

# Overview

Asia Current Status and Outlook - Temperature

Current Status:

Most regions have been warm or hot over the last few months, with a few exceptions. Central Asia was near normal or cold during December and January, followed by warm or hot conditions in February. Below normal temperatures were also experienced in Pakistan and parts of India during January as well as southern Vietnam over the last three months.

Outlook:

Over the next three months it is likely or much more likely to be warmer than normal across most areas.

3-Month Outlook April to June - Temperature

| Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely
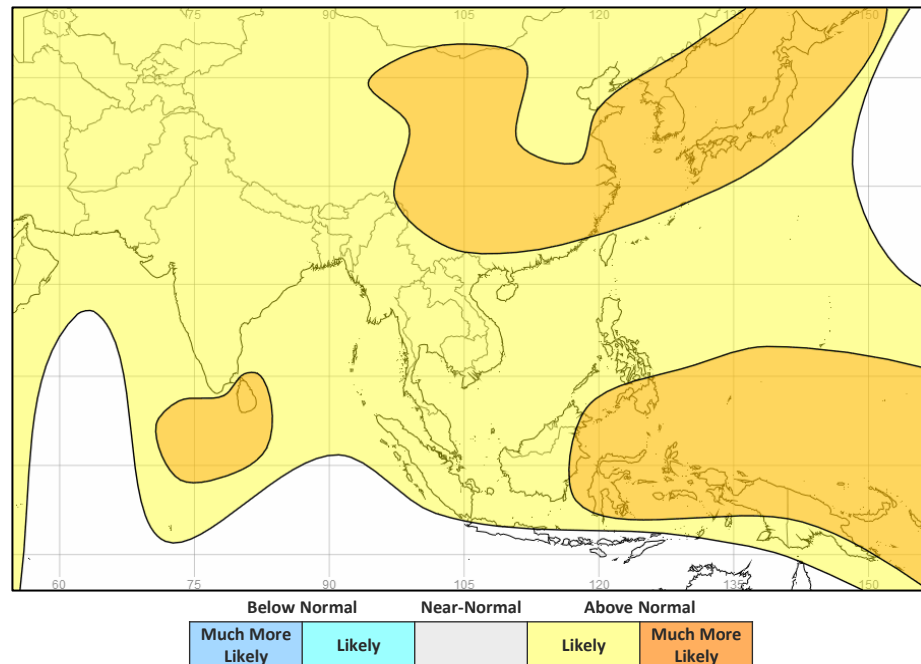
Asia Current Status and Outlook - Rainfall

Current Status:

Over the last three months much of Southeast Asia has been wet. Conditions were mixed over South Asia, where Sri Lanka has been predominantly wet whilst other parts have been near-normal to dry. Central Asia was near-normal to dry during December and then near-normal or wet during January and February.

Outlook:

Over the next three months, it is likely to be drier than normal for much of Indonesia, Malaysia, Sri Lanka and Bangladesh. It is likely to be wetter than normal in the Philippines and Papua New Guinea as well as parts of Pakistan.

3-Month Outlook April to June - Rainfall

	Below Normal		Near-Normal	Above Normal	
	Much More Likely	Likely		Likely	Much More Likely
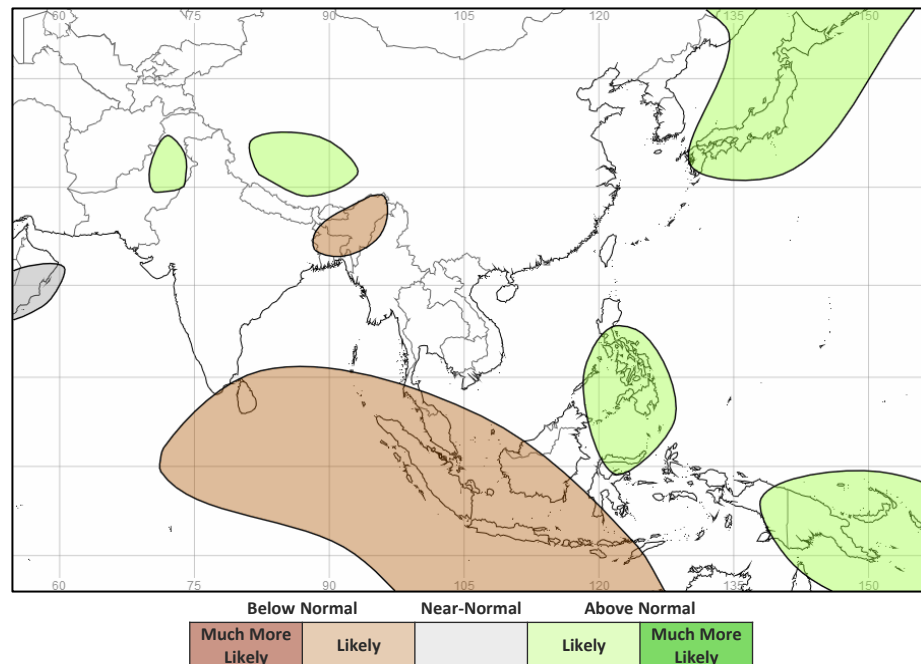
Global Outlook - Temperature

Outlook:

The recent La Niña has now ended with El Niño-Southern Oscillation (ENSO) neutral conditions likely to continue through to the early Northern Hemisphere summer.

Over the next three months, with the backdrop of a warming climate and the loss of the cooling influence of La Niña, most land areas are likely to be warmer than normal. Exceptions to this include northeast Brazil where temperatures are likely to be near-normal.

3-Month Outlook April to June - Temperature

| Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely
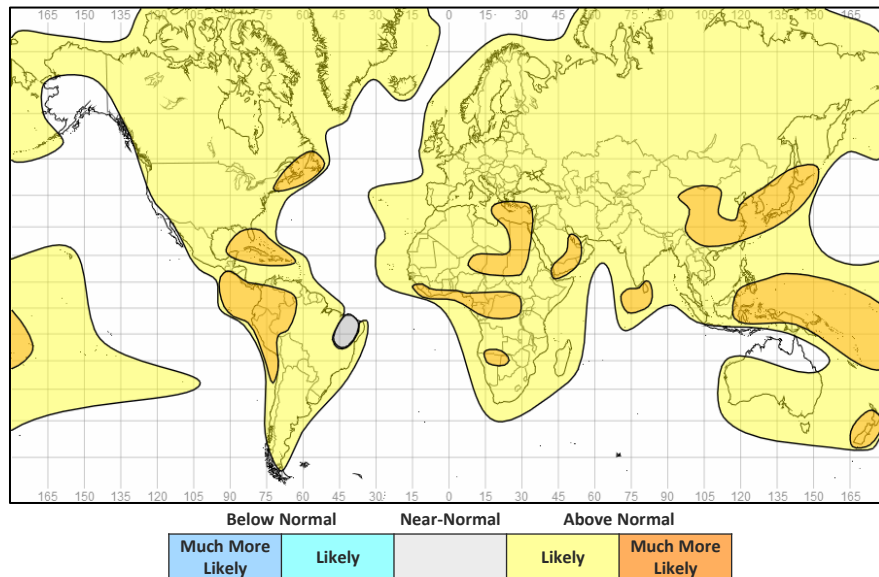
Global Outlook - Rainfall

Outlook:

El Niño-Southern Oscillation (ENSO) – The recent La Niña in the tropical Pacific Ocean has now ended with atmospheric and sea surface temperature conditions indicative of El Niño-Southern Oscillation (ENSO) neutral conditions. ENSO is most likely to remain in a neutral phase, at least through the Northern Hemisphere spring.

With ENSO-neutral conditions likely to continue through the Northern Hemisphere spring and early summer, predictability on seasonal timescales is expected to be lower than in recent years when ENSO has been active.

At longer lead times (Northern Hemisphere summer onwards) there is an increased likelihood of El Niño developing (60% for August-October). However, due to the spring predictability barrier, uncertainty in ENSO prediction is higher at this time of year, and this can typically be associated with lower forecast accuracy.

Indian Ocean Dipole (IOD) – The Indian Ocean Dipole is currently neutral and therefore won't provide any predictive value for this period. There is a chance that a positive IOD phase will develop during the Northern Hemisphere summer. However, like ENSO forecasts made at this time of year, forecast accuracy is also low for IOD predictions.

3-Month Outlook April to June - Rainfall

Below Normal		Near-Normal	Above Normal	
Much More Likely	Likely		Likely	Much More Likely
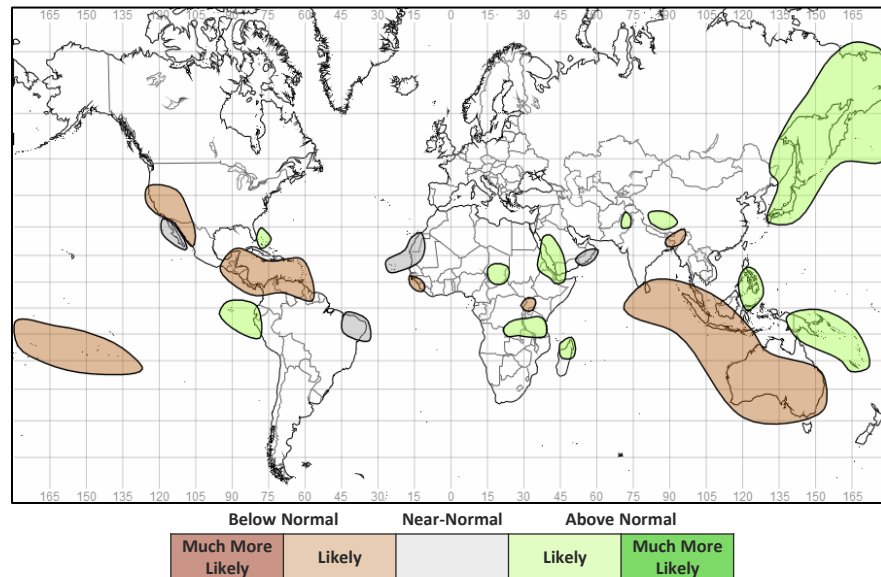
Current Status

Current Status – Temperature percentiles
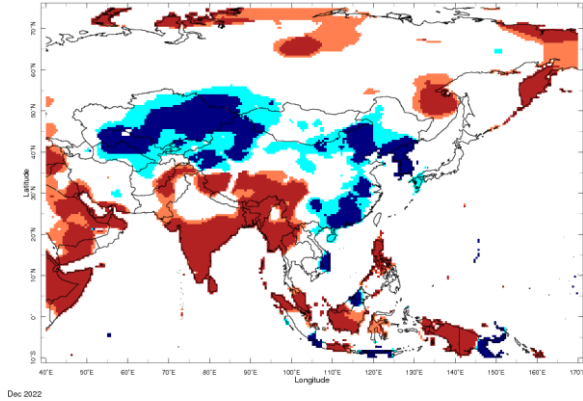
December
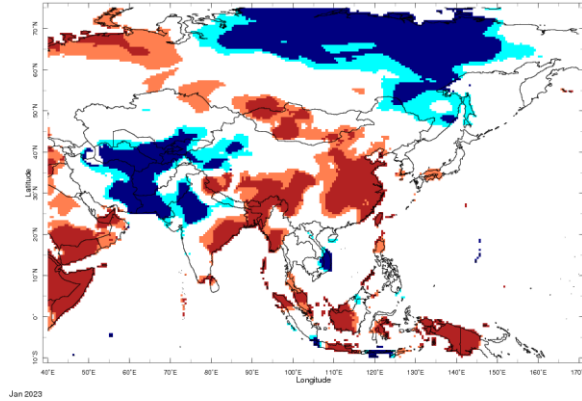
January
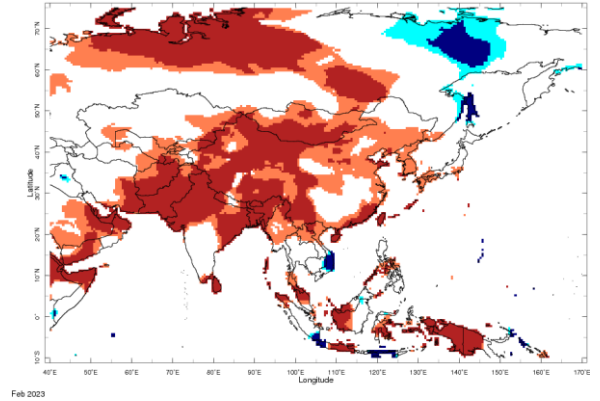
February

Temperature Percentiles (BLUE below 20th and RED above 80th)

| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |

Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981-2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions shaded in light and dark blue indicate values below the 20th (Cool) and 10th (Cold) percentile, with respect to the 1981-2010 climatology. The data used in this map are from the NOAA Climate Prediction Center.

Current Status – Precipitation percentiles

December

January

February

Rainfall Percentiles (BROWN below 20th and GREEN above 80th)

| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
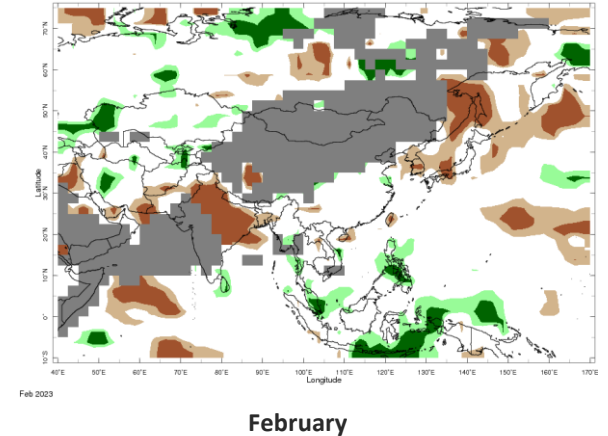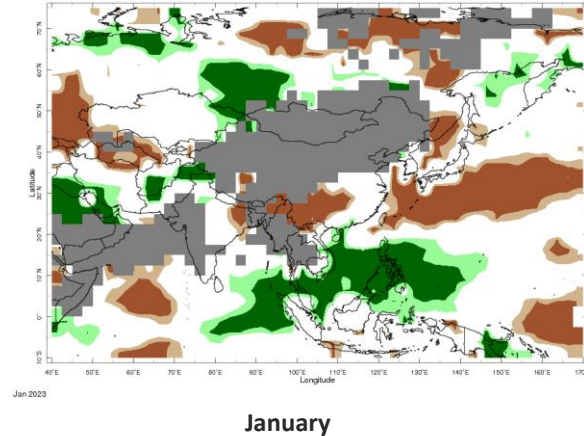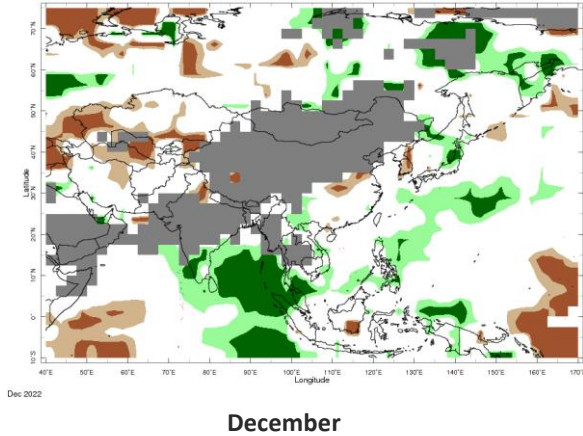
Notes: The percentiles shown in the map indicate a ranking of rainfall, with the 0th percentile being the driest and the 100th percentile being the wettest in the 1981-2010 climatology. Green and dark green shading represent values above the 80th (Wet) and 90th (Very Wet) percentile, respectively; regions shaded in light and dark brown indicate rainfall below the 20th (Dry) and 10th (Very Dry) percentile, with respect to the 1981-2010 climatology. Grey areas on the map mask out regions that receive less than 10 mm/month of rainfall on normal in the 1981-2010 climatology for the month. The data used in this map are from the NOAA Climate Prediction Center.

Current Status – Central Asia

Current Status: Temperature			Current Status: Rainfall		
December	**January**	**February**	**December**	**January**	**February**

	December	January	February		December	January	February
Afghanistan	Normal	Cold	Hot		Normal	Wet	Mixed (1)
Tajikistan	Normal	Cold	Warm		Normal	Normal	Wet
Kyrgyzstan	Cool	Cold	Warm		Very Dry	Normal	Wet

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Dry in the far south, wet in the far north, normal elsewhere

Current Status – Southern Asia

Current Status: Temperature				Current Status: Rainfall		
	December	January	February	December	January	February
Pakistan	Warm	Cool	Hot	Normal	Mixed (2)	Dry
India	Mixed (3)	Mixed (4)	Mixed (5)	Mixed (1)	Normal	Very Dry
Nepal	Normal	Normal	Hot	Normal*	Normal*	Normal
Bangladesh	Hot	Hot	Hot	Normal*	Normal*	Dry
Sri Lanka	Hot	Normal	Hot	Wet	Normal	Wet

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) **Note**: Large variations
(2) **Note:** Very wet in the far north, normal* elsewhere
(3) **Note:** Hot in central and southern regions, normal elsewhere
(4) **Note:** Cold in the northwest, hot in the east and northeast, normal elsewhere
(5) **Note:** Hot in the north and far south, normal elsewhere

Current Status – Southeast Asian Peninsula

Current Status: Temperature			
	December	**January**	**February**
China	Mixed (1)	Mixed (3)	Warm
Myanmar	Hot	Warm	Warm
Vietnam	Cool	Mixed (4)	Mixed (4)

Current Status: Rainfall			
	December	**January**	**February**
China	Normal	Mixed (2)	Normal
Myanmar	Normal*	Normal*	Normal
Vietnam	Wet	Wet	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Cool/Cold in north and east; Hot in the southwest and normal elsewhere
(2) Note: Very Dry in central and western regions, normal elsewhere
(3) Note: Warm/Hot in central and eastern areas, cool in the northwest, normal elsewhere
(4) Note: Normal in the north, cold in the south

Current Status – Southeastern Asia / Indonesia

Current Status: Temperature				Current Status: Rainfall		
	December	January	February	December	January	February
Indonesia	Mixed (1)	Mixed (1)	Mixed (1)	Normal	Normal	Mixed (3)
Papua New Guinea	Mixed (2)	Hot	Hot	Normal	Wet	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

(1) Note: Large variations across the country
(2) Note: Hot in the west, cold in the east
(3) Note: Large variations but many areas wet or very wet

Outlooks

Outlooks: Notes for use

Outlooks for months 4 to 6:

As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range.

Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Climatological odds:

A forecast is only provided in the outlooks where there is information in the model data about likely outcomes. Therefore, where the likelihoods for above-, near- and below- normal conditions are evenly balanced the phrase 'climatological odds' will be used. This means the outcome could fall anywhere within the possible climatological range. Near-normal conditions should not necessarily be assumed, and users should update with shorter-term forecasts when available.

Outlook: April to September – Central Asia

		Forecast summary		
		April	April to June	July to September
Afghanistan	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal in the north; Climatological odds in the south	Climatological odds	Likely to be near-normal
Tajikistan	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Kyrgyzstan	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Likely to be wetter than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlooks

Outlook: April to September – Southern Asia (1)

		Forecast summary		
		April	April to June	July to September
Pakistan	*Temperature*	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal in the north; Climatological odds in the south	Likely to be wetter than normal in the north; Climatological odds in the south	Likely to be near-normal
India	*Temperature*	Climatological odds	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds in the north; Likely to be drier than normal in the south
Nepal	*Temperature*	Climatological odds	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: April to September – Southern Asia (2)

		Forecast summary		
		April	April to June	July to September
Bangladesh	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Likely to be drier than normal	Climatological odds
Sri Lanka	*Temperature*	Likely to be warmer than normal	Much more likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: April to September – SE Asian Peninsula

		Forecast summary		
		April	April to June	July to September
China	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Climatological odds	Climatological odds	Climatological odds
Myanmar	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Much more likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Climatological odds	Climatological odds
Vietnam	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Climatological odds	Climatological odds

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlooks

Outlook: April to September – SE Asia / Indonesia

		Forecast summary		
		April	April to June	July to September
Indonesia	*Temperature*	Likely to be warmer than normal	Climatological odds in the south; Likely to be warmer than normal elsewhere	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Likely to be drier than normal
Papua New Guinea	*Temperature*	Much more likely to be warmer than normal	Much more likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Annex 1 – Supplemental Information

For further information

WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME)
https://www.wmolc.org/

International Research Institute for Climate and Society (IRI)
http://iridl.ldeo.columbia.edu/maproom/

NOAA El Niño technical info
https://www.ncei.noaa.gov/access/monitoring/enso/

Met Office
https://www.metoffice.gov.uk/services/government/international-development

The South Asian Climate Outlook Forum (SASCOF) http://www.imdpune.gov.in/Clim_RCC_LRF/Index.html
Latest Output (September 2022) - http://sahfhydromet.rimes.int/wp-content/uploads/2022/10/Enhanced-SCOS-SASCOF-23-JJAS.pdf

Technical notes

The [WMO lead centre for long-range forecast multi-model ensemble (LC-LRFMME)](#) produce a probabilistic multi-model mean forecast product in which the multi-model mean is based on uncalibrated model output with a model weighting system that accounts for errors in both the forecast probability and ensemble mean. The method used by LC-LRFMME separately computes a probabilistic forecast and calculates tercile probabilities with respect to climatology for each individual model, before creating the weighted multi-model mean. In seasonal prediction, shifts in the tercile probabilities are always closely associated with the shifts in the probability of extremes, and we can use the probability of terciles to provide information on the likelihood of above- or below- normal conditions. The thresholds used in the forecast summaries are defined below.

Seasonal forecasts rely on the aspects of the global weather and climate system that are more predictable, such as tropical sea-surface temperatures or the El Niño–Southern Oscillation (ENSO). However, whilst such forecasts may be able to show what is more or less likely to occur, they acknowledge that other outcomes are possible.

In addition, forecast uncertainty generally increases with longer range so the 6-month outlook is less reliable. It is also based on less information, because not all models are available to this range. Therefore the information presented here should be used to raise early awareness of potential hazards, and should be updated with the 3-month outlook when available.

In the report and tables precipitation is referred to as rainfall but in fact encompasses any form of water, liquid or solid, falling from the sky. Temperatures are the (2 metre) near-surface temperature.

Description	Definition
Much more likely to be below normal	When probability of lower tercile > 70%
More likely to be below normal	When probability of lower tercile is 40-70%
Likely to be near-normal	When probability of middle tercile is 40-70%
Much more likely to be near-normal	When probability of middle tercile > 70%
Likely to be above normal	When probability of upper tercile is 40-70%
Much more likely to be above normal	When probability of upper tercile > 70%
Climatological odds	When probabilities for all categories are roughly 33%

Global Producing Centres (GPC) forecasts used by WMO LC-LRFMME:

- GPC CPTEC (INPE),
- GPC ECMWF,
- GPC Exeter (Met Office),
- GPC Melbourne (BOM),
- GPC Montreal (CMC),
- GPC Moscow (Hydromet Centre of Russia),
- GPC Offenbach (DWD),
- GPC Pretoria (SAWS),
- GPC Seoul (KMA),
- GPC Tokyo (JMA),
- GPC Toulouse (Meteo France),
- GPC Washington (NCEP)

Enquiries

Email: internationaldevelopment@metoffice.gov.uk

Web: https://www.metoffice.gov.uk/services/government/international-development